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Unraveling the Development of Underdevelopment: Examining the Impact of Foreign Investment on Economic Growth across Income Groups, 1997-2011

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Unraveling the Development of Underdevelopment:

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by

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Unraveling the Development of Underdevelopment: Examining the Impact of Foreign Investment on Economic Growth across Income Groups, 1997-2011

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Abstract

Debate upon the effect of foreign investment dependency on economic growth has been lasting for 40 years. Modernization theory upholds the positive effect of foreign investment. However, world-systems theory posits the development of the core relies on underdevelopment in the periphery. This theory breaks the fantasy of development and prompts cruel facts to challenge the modernization theory. The current research continues the previous studies of foreign investment dependency and economic growth. After controlling the effect of export dependency, population growth, urbanization and female labor participation, the current research finds that the effect of foreign investment dependency diverges across development level groups. For lower-developed countries, foreign investment demonstrates a negative effect on economic performance, but a positive one in rapidly developing countries. This divergent effect opens a window on the universe of world-systems research and encourages future research to focus on variation of foreign investment's effect across different development levels as well as its source, composition and target industries.

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INTRODUCTION

The past decades witnessed the juggernaut of globalization and world-economy. International division of labor and worldwide flow of capital, resources and profit has facilitated profound transformation in societies across the globe. One segment of nations that has experienced high levels of social change includes rapidly developing nations, such as China, India, and Brazil. These nations have experienced comparatively high rates of economic growth in recent decades, and also represent key sites of international investment. Since the 1970s, a growing body of literature in sociology and economics developed a world-systems perspective to examine structural features and changes in the global economy. This perspective provided a sharp argument against traditional modernization theory, which had dominated developmental theory and policy during the 1950s and 60s. Unlike the optimistic outlook of modernization theorists, world-systems scholars are concerned with processes of dependency concealed beneath the jubilation of increased economic globalization or successes in per capita economic growth in some semi-periphery nations. In the early 1990s, Firebaugh (1992) and Dixon and Boswell (1996) prompted a scholarly debate on this topic and twenty years later, it continues to have resoundingly far-reaching implications. The debate surrounds whether foreign investment promotes economic growth or underdevelopment in recipient economies.

Indeed, the two branches of global sociological theories, the modernization perspective and the world-systems perspective, explain the effects of foreign investment differently. The

modernization perspective argues foreign investment positively functions to promote host economy by creating new jobs, innovating technology and restructuring industries.

Dependency theory, however, challenges this longstanding theoretical framework by arguing that increased investment dependence, principally in non-core nations, only promotes processes of offshoring of resource-degrading and low wage, labor-intensive sectors which stifles successful development. The empirical evidence from each of these traditions has been mixed, as some find that foreign direct investment increases economic growth (Firebaugh 1992), and others find that investment dependence reduces economic growth, as well as negatively impacting a number of social and environmental outcomes as well (Bornschier and Ballmer-Cao 1978; Bornschier and Chase-Dunn 1985; Dixon and Boswell 1996; Kentor 1998; Kentor and Boswell 2003). One potential explanation for the inconsistent findings presented across these two literatures involves the analysis of samples of all nations or all less-developed nations. As some rapidly-developing semi-periphery nations, such as China and Brazil, have been able to achieve comparatively high levels of economic growth over the last couple of decades and tend to have production profiles that are more industrialized than periphery nations, it is possible that the effects of foreign investment play out differently in different strata of the world-economy.

I will begin by describing key ideas from modernization and world-systems perspectives. Through this discussion, I will also examine empirical evidence that supports each line of theory, as well as evidence that suggests that foreign investment might have different impacts across periphery, semi-periphery, and core nations. I will then present my formal hypothesis, methods, and results. I will conclude by examining the implications of this research, as well as future directions in this line of inquiry.

MODERNIZATION THEORY ON INVESTMENT DEPENDENCE

Together with land and labor, investment is integral to production. A longstanding economic tradition of modernization theory defiantly believes, to quote Firebaugh (Firebaugh 1992), "other endowments being equal, the more land, the more output; the more labor, the more output; and the more capital, the more output." Modernization theory views the world is composed of autonomous nation-states and they all follow independently a unilinear path toward development (Rostow 1990). Modernization theorists advocate foreign direct investment as a means of increasing the income and savings of recipient countries and providing competition as well as foreign exchange for economic growth (Meier 1964). Therefore, an increase of foreign investment is positively associated with development. From this perspective, negative outcomes of foreign investment in less-developed countries are rooted in less-developed countries themselves.

Rostow (1990) makes significant contributions to modernization theory with an economic focus on "stages of growth". Lewis et al (1945) contends foreign investment "helped to increase the quantities and varieties of goods and services". Modernization theory echoes Ricardo's comparative advantage theory (Ricardo 1891) and refocuses globalization research on global inequality rising from differential productivity of resources and labor among countries. This theory justifies countries' using their comparative advantage in world-economy, such as low labor cost and abundance of natural resources. Therefore, as Jenkins (2013) notes, foreign investment is simply a capital flow which can promote total output of the recipient economy and it can also increase host economy income under the assumption of perfect market competition.

Some empirical research following modernization theory tracks positive effects of foreign investment on economic growth. Empirical study by Firebaugh (1992) detects a

beneficial impact of foreign investment stock on economic growth and claims that "investment spurs growth", challenging the finding by Bornschier and Chase-Dunn (1985) of "investment inhibits growth". As Konings analyzes consequences of large flow of foreign investment directed to Central and Eastern Europe following the downfall of Communist regimes, he contends that not only does foreign investment restructure domestic companies, but technological "spillovers" also promote domestic development (Konings 2001). However, Aitken and Harrison's (2001) case study on Venezuela's management of foreign investment showcases foreign equity participation is positively associated with productivity in plants with less than 50 employees, but negatively affects the productivity of wholly domestically owned firms.

Some other neo-classical synthesis for analyzing foreign investment argues that foreign investment exists as a result of market imperfections. Buckley and Casson (1976) marshaled the theory of "internalization" and contend that "internalization" is a way of bypassing imperfections in foreign markets. From this perspective, international flow of capital overcomes market failure and increases overall efficiency of world economy (Casson 1979). However, this theory is particularly problematic when it assumes market failure is exogenous and transnational corporations, as the major carrier of international flow of capital, do not generate any imperfections.

WORLD-SYSTEMS THEORY ON INVESTMENT DEPENDENCE

World-systems theory argues against modernization theory and emphasizes the oligopolistic feature of foreign capital, and that foreign investments in poorer nations can have harmful impacts on the recipient economy. World-systems theory spotlights global stratification under the force of institutionalized reorientation of economic growth in the periphery toward the benefit of the core countries (Frank 1969; Wallerstein 2004). Under the mechanism of the global

production system, core countries clench production dominance of high-value goods and seek comparatively cheap workforces to supply raw materials in periphery nations to maintain their competitiveness on global market. The global economy is therefore marked by patterns of international unequal exchange (Amin 1976).

In the framework of world-systems theory, inequality dominates international investment and trade. Price and values of products and production are evaluated following the interests in the core. Raw materials and agricultural products, which are abundantly produced in the periphery, and significantly foster economic growth in more developed nations, are depreciatively valued and stifle development. Wallerstein proposes that a country's position in world-system is determined by its production's profitability level in world-economy and which directs surplus-value to flow from the periphery to the core: "What we mean by core-periphery is the degree of profitability of the production processes. … There is a constant flow of surplus-value from the producers of peripheral products to the procedures of core-like products. This has been called unequal exchange" (Wallerstein 2004). In the context of unequal exchange, ownership of capital determines that recipient economies are inhibited or even underdeveloped. Core investors promote the off-shoring of dirty and low-wage industries that are cheaper to produce in peripheral areas facing extreme poverty and a lack of regulation. Profits are exported back to the owners of capital, but therefore unlikely to promote successful growth in poor countries (Amin 1976).

World-systems theory, unlike modernization theory, warns of possible negative effects of foreign capital penetration because country's position in the international division of labor is differential and a major cause of "development of underdevelopment" in the periphery (Frank 1966; Wallerstein 2004). The underdevelopment of the periphery, resulting from the intrusion of

core actors retards economic growth and disarticulates peripheral economies. The accruement of surplus value in the core reproduces global inequality (Amin 1976; Wallerstein 2004).

Since 1980s, a large number of empirical studies has tested dependency theory's argument of development of underdevelopment using measures of foreign capital penetration to measure investment dependence. Bornschier and Chase-Dunn separated foreign investment's effects into two phases and differentiate short- and long-term consequences of foreign investment (Bornschier and Chase-Dunn 1985). In their research, the short-term effect from foreign investment flow demonstrated positive effects on economic growth, whereas retardant effects were detected with accumulative foreign investment stock. This research so much substantiated dependency theory's argument that it is numerously cited in subsequent research. However, as previously described, Firebaugh challenged this dependency perspective. He argued that foreign investment "apparently promotes growth over the long run as well as over the short run" and dependency research is "based on an error" (Firebaugh 1992). Dixon and Boswell argued that Firebaugh failed to differentiate between "foreign investment" and "foreign investment dependence". Foreign capital per se cannot fully explain retarded economic growth, but capital's control over the host economy leads to negative effects (Dixon and Boswell 1996). They used foreign investment over gross domestic product (GDP), or foreign capital penetration, to measure an economy's foreign investment dependency, which was preponderantly used in subsequent research. Kentor's (1998) research provided more solid support for the finding by Bornschier and Chase-Dunn (1985) and Dixon and Boswell (1996). He used a panel dataset with a longer time period to confirm that high dependence on foreign investment inhibits economic growth in the periphery.

Prior empirical studies have substantiated foreign investment as detrimental to economic growth and economic inequality, but pressing global challenges, such as environmental degradation, biodiversity loss and starvation, motivate globalization research to extend its scope to explore more possible outcomes of foreign investment. Recent studies attach more concerns to foreign investment dependency instead of its penetration to probe its effect on host economies. Wimberley and Bello (1992) found transnational corporation investment penetration is detrimental to food consumption over the long term and this harmful effect outstrips primary export dependence. Jorgenson et al. (2008) examined the impact of foreign investment dependency on pesticide and fertilizer use in less-developed countries. Results confirmed that both pesticide and fertilizer use in less-developed countries is positively associated with primary sector foreign investment dependency. Some other research detected negative effects of foreign capital along a wider spectrum of economic, social and political dimensions, including income inequality, unemployment, xenophobic movements and fertility rates (Bornschier and Ballmer-Cao 1979; Bornschier 1980; London 1988; Rubinson 1976; Timberlake and Kentor 1983).

Dependency theory casts a gloomy outlook of countries as receivers of international capital. However, this theory needs a careful review in the current era, as core nations, who often receive the highest levels of investment, chiefly from other core nations, have been through major economic recession. Additionally, emerging economies in the semi-periphery, such as China and India, have contributed the most economic growth to the world economy, while the level of increase in foreign investment outstripped the core in 2011 (United Nations Conference on Trade and Development 2013). The relative success of some rapidly developing nations is often hailed as victory of modernization developmental theory. However, continued disparity between the global rich and poor is glaring. And while poorer nations such as Sub-Saharan

African nations have also been sites of increased investment, these nations have not been propelled into growth. To quote a report from United Nations Children's Fund, "as of 2007, the wealthiest 20 percent of mankind enjoyed nearly 83 percent of total global income compared to the poorest 20 percent, which had exactly a single percentage point under the global accounting model" (Ortiz and Matthew Cummins 2011). These challenges and facts propel renewed interest in the FDI – income growth debate.

Studies on the growth of newly industrializing countries (NICs) often focus on the cases of mini-dragons in Asia (such as Taiwan, South Korea). The success stories of these countries are used to support modernization theory's argument that foreign capital and export dependence positively contributes to economic growth in recipient economies. However, some research invites people to examine the high level of the recipient government's involvement to use and guide foreign investment. McMichael (2011) finds Third-World countries are inevitably involved in the process of industrialization, and in some nations this results in underdevelopment more so than others. Some countries rejected neoliberal prescriptions and formulated strong political management to guide public and private investment to promote domestic economic growth. Evans (1995) developed a theory of "embedded autonomy" to emphasize the two-dimension importance of applying political power to promote domestic participation in economic development. From his perspective, operation of state power is effectively strong only in the condition that state power can make independent moves to assert autonomous power, and at the same time, construct highly-efficient connections between state government and society channels for the negotiation of policies and goals. Viewing from another perspective, Sheppard (2009: 436) argues that shrewd domestic policy to direct foreign investment can "create new comparative advantages for which these countries previously had no advantage at all." Hence, it

possible that that foreign investment may demonstrate divergent effects on economic growth of recipient economies across different development levels.

In short, the big debate regarding the effects of foreign investment on economic growth in host economies is rooted in different conceptualizations of investment dependence. For dependency theorists, investment dependency is understood as expanding the power of core interests in peripheral nations, allowing core actors to invest in industries that will only be profitable for them. This process is facilitated by financially and economically dominant powers of transnational corporations, and these patterns were initially forged in colonial times (Amin 1976). However, neoclassical economists uphold the understanding that foreign investment is a natural flow of resources and capital into an economy under the force of changing supply and demand from all directions. Such flow of resources and capital is a sui generis economic fact and can hardly be modified or redirected by political intention (Bornschier, Chase-Dunn, and Rubinson 1978). Not only does this divergent conceptualization explain the big debate regarding foreign investment dependence and economic performance involved in development issues, but it also substantiates research designs, sample sizes and inclusion of independent variables in explanatory models.

Some other research questions where foreign investment goes and whether foreign investment in the primary sector and low value-added production wields more detrimental influence over the host economy's growth. Alfaro (2003) found foreign investment directing to primary sector negatively impacts on growth, but investment in manufacturing demonstrates a positive effect. Similarly, emerging understanding about some rapidly developing nations suggests that these nations were able to use strong domestic policies to make foreign investment more beneficial to them. This leads us to more carefully examine the relationship between FDI

and economic growth, by making comparisons across income groups. Considering that the effects of foreign investment may be different across peripheral, rapidly developing semi-peripheral, and core nations may shed light on the differential findings observed by modernization and world-systems/dependency theorists.

HYPOTHESES

I hypothesize that the effects of FDI will vary across income groups, where it will be more likely to negatively impact growth in peripheral nations and more likely to increase economic growth in developed and rapidly-developing semi-peripheral nations.

METHODS

Sample

Prior studies have divergent viewpoints on what countries should be included in analyses examining the effects of investment dependence or other forms of dependence on developmental outcomes. Some research only includes less-developed countries and its argument for exclusion of more-developed countries is better focus on processes of underdevelopment in less-developed countries. Other research includes all countries in their analyses, trying to measure impacts across all nations. Some of these then use dummy variables to reflect the divergence of effects between core, peripheral and semi-peripheral countries.

The current research utilizes data on 201 countries from the World Bank's World Development Indicators database. I categorize countries based on their income level into 3 groups by considering "low-income" and "lower-middle income" countries into a less-developed category. The second category represents rapidly developing semi-periphery nations classified by the World Bank as "upper middle income". The third category represents core nations, or

nations classified as “high-income” by the World Bank. Countries included in the analyses by income level are listed in Appendix A.

Fixed Effects and Random Effects Models

Heterogeneity bias, which refers to unobserved individual differences, is a common problem to analyzing panel data. Unlike the case of cross-sectional analysis, in panel data analysis, some unobserved factors within each individual may impact changes on the dependent variable. Macro-sociological quantitative research uses fixed-effect and random-effect to deal with heterogeneity bias when using panel datasets (Jorgenson, Austin, and Dick 2009; Jorgenson and Kennon A. Kuykendall 2008) . Fixed effects, also known as “deviation from mean” (Hill, Griffiths, and Lim 2008), assign each individual a distinctive intercept to capture individual differences. In this way, all unobserved time-invariant individual characteristics are held and absorbed in the intercept. Fixed-effect model, in particular, can reveal the impact of variables that vary over time, controlling for all individual-specific characteristics. Therefore, fixed-effect estimators can be unbiased.

Another approach to handle heterogeneity bias is recognizing the randomness present in individual differences. Instead of eliminating unobserved time-invariant individual characteristics, the random-effect model assumes individual difference is random and explained by the degree to which each individual deviates from the mean. This deviation is random and termed as “random effects”. The recognition of randomness of individual differences enables regression estimation to take between-individual differences in estimating impact of independent variables on the dependent variable. Hence, random-effect model is first considered when differences across individuals wield influence over the dependent variable in a model. Random-effect model uses generalized least squares estimation and it produces estimators with lower

variance but higher probability of unbiasedness, compared to the ordinary least squares estimators from fixed-effects model. However, the fundamental differences between fixed-effect and random-effect models is their estimation assumption. Different from fixed-effect model, random-effect model assumes variation across individuals are not correlated with explanatory variables in a model, as how it is indicated by Greene: "…the crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not" (Greene 2008). This assumption allows random-effect model to include time-invariant variables as explanatory variables.

For making a decision over fixed-effect or random-effect model, the Hausman test is a common statistical tool to substantiate the choice. The Hausman test, with the null hypothesis that there is no correlation between explanatory variables and the error term in a regression model, is designed to detect endogeneity bias in a model. A model with significant result of the Hausman test suggests the presence of endogeneity bias, which renders random-effect estimation no longer unbiased (Hill, Griffiths, and Lim 2008). Though the Hausman test's result offers persuasive decisions, its ignorance of research questions and the sociological implication of regression models makes the decision arbitrary and theoretically-obsessed.

In this research, I use fixed-effect model to examine the impact of investment and export dependency on economic performance among 201 countries by removing differences across cases and focusing on causes of changes within nations. I use random-effect to detect across countries the factors that influence economic growth. I report coefficient estimates from both methods. I use the STATA 12 statistical package, which provides easy access to building fixed-effect and random-effect models.

Dependent Variable

This research uses per capita gross domestic product to measure the economic development of each country. I collect the annual data from the World Bank's open database for each country from 1997 to 2011. Though the data of GDP per capita are recorded and collected annually, the global impact on GDP per capita is assumed to be not instantaneous, but rather takes effect over some period of time. Previous research (Kentor 1998; Kentor and Boswell 2003) made profound argument that global changes are neither constant nor linear and it is necessarily important to develop models permitting short- and long-term processes. In the current research, building on previous studies (Chase-Dunn 1975; Kentor 1998; Kentor and Boswell 2003), I first built a one-year lag, where the independent variables are measured one year prior to the GDP outcome variable.

Independent Variables

Foreign investment dependence The key independent variable is foreign investment dependence. There is a large body of literature using different indicators to measure different aspects of foreign investment dependence. Chase-Dunn (1975) used data of "debits on investment income" from the International Monetary Fund Balance of Payments Yearbook to measure the investment dependence. Kentor (1998) differentiated "foreign investment concentration", which refers to the "largest percentage of foreign direct investment stocks obtained from a single country". One of the most common ways of measuring foreign investment is sometimes referred to as "foreign capital penetration", which is "the ratio of foreign direct investment stocks to total GDP". The current study, continuing these previous studies, measure a country's dependence on foreign investment by foreign direct investment as percentage of gross domestic product.

The existing literature also demonstrates a longstanding tradition to recognize the distinction between foreign investment flow and stock (Bornschier, Chase-Dunn, and Rubinson 1978) on economic performance. Chase-Dunn (1975) contends that foreign investment stock, which suggests cumulated value of foreign-owned investment, tends to demonstrate a stronger long-term effect *vis-à-vis* foreign investment flow, which measures the inflows of foreign investment for some time period, has more instantaneous effect on economic performance. This argument has a wide impact on subsequent studies on international dependency (Firebaugh 1992). The current study, focusing on the long-term effect of foreign investment on host economy's performance, uses foreign investment inward stock in building the key independent variable. The data are retrieved from the online database of the United Nations Conference on Trade and Development and standardized by the same year gross domestic product (Kentor 1998). I recoded the percentage into its natural logarithm form to normalize its distribution.

Export dependence Many nations have focused on exports as a means to modernize, and a wide literature on the effects of export dependence from both a modernization and world-systems dependency perspective debates the effects of export dependence in much of the same fashion as is explored here with investment dependence.[1] While addressing the debate

[1] This idea comes from a longstanding theoretical construction. Both modernization theory and world-systems theory recognizes increasing globalized international trade, but their scrutiny diverges. Modernization theory, deriving from Richardo's (1891) concept of comparative advantage, highlights the benefits of worldwide commodity exchange, such as escalating efficiency in assorted industries, growing supply and demand, and overall improvement of social well-being. Dependency theory, however, views international trade which directs the profit generated from the periphery to flow back to the core. In this process, the disparity between the core and the periphery is entrenched and international trade, therefore, develops the core at the cost of underdevelopment of the periphery (Amin 1976; Wallerstein 2004).

Recent advancement of dependency theory on international trade particularly focuses on core countries' offshoring environmental cost to the periphery. Undesirable environmental cost from production and consumption, such as water and air pollution (Shandra, Shor, and London 2009), biodiversity loss (Shandra et al. 2009) and deforestation (Jorgenson 2008; Jorgenson 2006), is externalized to less-developed countries and explains some of less-developed countries' environmental calamity. Some other research probes the unequal exchange as exploiting

surrounding export dependence and development is not the key focus of this paper, controlling for export dependence is relevant, and examining the patterns across income groups may help to inform this topic. I therefore include export dependence (calculated as total exports of goods and services as percentage of GDP) into the models. This measure is obtained from the World Bank and is recorded in constant 2005 U.S. dollars.

Total population growth Population dynamics are introduced in regression model in existing empirical literature analyzing environmental impact of unequal exchange, trade dependence and foreign investment dependence. Malthus made the widely-recognized argument that population growth will eventually outstrip the capacity of technology to provide staple food and become a burden and tardiness of economic development (Malthus and Hollingsworth 1973). Population growth also casts negative effects on environment because overpopulated market demand directs production to deplete resources to meet increasing market demand with few considerations of environment as a public good. Previous research on investment dependence and economic growth includes the population growth rate into estimation models as an important control (Austin, McKinney, and Thompson 2012; Jorgenson and Kennon A. Kuykendall 2008; Shandra et al. 2009). The data are from the World Bank's online data bank.

Urban population percentage Urbanization, especially when it occurs in developing countries, tend to increase economic opportunities and attracts people to live in cities. Therefore,

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low value-added raw materials and agricultural products from the periphery as well as the energy and material loss in less-developed countries (Bunker 1984; Bunker and Paul S. Ciccantell 2005; Bunker 1985).

The current study uses the total export of goods and services as percentage of gross domestic products of the same country in the same year to measure the extent to which a country is dependent on export to support economic development. This method was used in some globalization studies as a control variable to study the impact of foreign investment on economic growth and economic inequality (Dixon and Boswell 1996). I took data of export of goods and services and gross domestic products from World Bank and both data are recorded in constant 2005 U.S. dollar.

urban population as percentage of total population in a country not only measures the relative level of urbanization in a country, but also an important indicator to determine population flow and advancement of industry and manufacturing of some countries. It is thereby assumed to be positively associated with economic growth. However, some other research also reveals the negative impacts of urbanization. In particular, Timberlake and Kentor (1983) revealed foreign investment brings inhibition of economic development in a country as well as overpopulation in cities. Furthermore, consequence of urbanization varies across countries. Though urbanization and industrialization coexist in many countries, urbanization is poorly associated with industrialization in countries like Bolivia, Gabon and Congo-Brazza, where have become highly urbanized yet lack industry and manufacturing (except mineral extraction). I retrieve this data from the World Bank's online data bank.

Democracy I use the 21-scale "Polity Score" developed by Polity IV Project to measure the relative level of political freedom of countries in the sample. This score incorporates Polity IV's measurement of "democracy" and "autocracy". The score considers political institutions, power constraint, and civil liberty. Moreover, it also takes the change of political quality over time into account (Marshall, Gurr, and Jaggers 2013). The original data adopts the scale from -10 to 10. I add 10 points to each score to convert them to positive numbers, where a larger number indicates increased democracy.

Labor participation (Female %) Female labor participation, especially in lower developed countries, is likely to be associated with economic development as more modernized nations have reduced gender discrimination and increased contributions to the formal labor market can increase GDP growth. This data are acquired from the World Bank.

RESULTS

Descriptive Analysis

Table 1 reports basic descriptive statistics for all measures included in the analyses. Although it summarizes all data into a pooled table, it reveals some important patterns. It is obviously shocking to find the disparity between the minimum and maximum of GDP per capita. While this table does not take into account time and could reflect changes over time, the disparity is still keenly reflective of the extreme level of global inequality.

For all countries, the standard deviation of foreign dependency is big, compared to the relatively low standard deviation of export dependency. And the disparity between mean and median of investment dependency is larger than export dependency. This result suggests a non-normal distribution of the two variables. Their skewness and kurtosis buttress this conclusion. Thus, I transform the two variables into their natural logarithm form to normalize their distribution for better estimation. Population dynamics also demonstrate high variation. Its minimum drops down below zero, which implies a slow-down population growth, but the maximum is over 15, which nevertheless highlights the population burden and shortage of resources supply in some countries.

Given the limitation of this pooled data, I next present and describe the descriptive statistics by income group. The results are reported in Tables 2 and 3.

Table 1. Mean, Median and Standard Deviation for All Countries

Variables	Min	Max	Mean	Median	SD	Skewness	Kurtosis
GDP Per Capita (One-Year Lagged)	50.0422	117493.6000	9857.1580	3098.8290	15857.6700	2.9287	14.2997
Foreign Investment Dependency (FDI / GDP)	0.0006	15.4401	0.4843	0.2582	0.9290	8.0775	96.0180
Export Dependency (Total Exports / GDP)	0.0449	3.8546	0.4298	0.3628	0.3262	3.5897	25.1278
Population Growth (Annual %)	-4.1786	17.4832	1.4930	1.4377	1.4999	2.1482	20.9301
Urban Population Percentage (%)	7.6250	100.0000	55.8476	55.8058	24.4800	0.0148	1.9404
Democracy	0.0000	20.0000	13.3509	16.0000	6.5475	-0.6402	1.9075
Labor Participation (Female %)	11.0000	88.8000	51.5109	51.8000	16.3140	-0.1499	2.9369

Table 2. Mean, Median and Standard Deviation of Variables by Country Group

Variable	Mean			Median			SD		
	A	**B**	**C**	**A**	**B**	**C**	**A**	**B**	**C**
GDP Per Capita (One-Year Lagged)	3469.3710	7314.5020	18773.7300	940.7521	3186.7640	12823.0300	9148.9340	13119.3600	3.66E+08
Foreign Investment Dependency (FDI / GDP)	0.3716	0.5532	0.5852	0.2002	0.2920	0.3783	0.8410	1.1935	0.5535
Export Dependency (Total Exports / GDP)	0.3305	0.4302	0.5520	0.2889	0.4216	0.4417	0.2778	0.2273	0.1574
Population Growth (Annual %)	1.7676	1.4801	1.2086	1.8321	1.5279	0.9064	1.2552	1.2033	3.3661
Urban Population Percentage (%)	36.3354	60.7064	74.2590	35.0192	63.3704	79.4736	15.6243	17.0230	21.0751
Democracy	11.5445	12.9895	16.5111	13.0000	16.0000	20.0000	5.7676	6.4734	6.6125
Labor Participation (Female %)	55.3475	45.4662	51.1001	56.2000	46.8000	51.8000	18.6559	15.5587	11.2316

Table 3. Distribution of Variables by Development Level

Variable	Skewness			Kurtosis		
	A	**B**	**C**	**A**	**B**	**C**
GDP Per Capita (One-Year Lagged) [ln]	0.8693	0.2895	-0.8523	3.5515	3.4527	3.2121
Foreign Investment Dependency (FDI / GDP) [ln]	-0.4288	-0.1247	-0.5687	4.6460	3.7829	3.7008
Export Dependency (Total Exports / GDP) [ln]	-0.0908	-0.3293	0.1844	4.1290	2.7308	3.4971
Population Growth (Annual %)	0.1290	-0.2200	3.4868	4.9332	4.0407	26.0768
Urban Population Percentage (%)	0.3792	-0.2523	-1.0226	2.3114	2.4865	3.5456
Democracy	-0.3579	-0.6010	-1.6726	1.7802	1.7251	4.0231
Labor Participation (Female %)	-0.2460	-0.4483	-0.1774	2.2756	2.6987	4.5545

Table 2 presents mean, median and standard deviation of all variables by income groups. The letter nominations represent the different income groups, where “A” stands for less-developed countries, “B” for rapidly developing countries, and “C” for high-income countries. Presenting the data in this way offers some noteworthy patterns.

Across country groups, the mean of GDP per capita between rapidly developing (B) and core (C) is nearly three times of the difference between the periphery (A) and the rapidly developing semi-periphery (B). The median also demonstrates a similar pattern. Within one country group, mean of the periphery group A is remarkably higher than its median. Although the other income groups also display this pattern of the mean being higher than median, the chasm is not as deep as for the low-income or periphery group. Both mean and median of foreign investment dependency and export dependency increase with escalation of income. Countries in higher income group tend to have a higher percentage of foreign direct investment. Population growth slows down in higher income groups and urban population percentage increases. Countries at lowest development level denotes higher percentage of female labor participation, and this number decreases in rapidly developing countries, but then increases in higher income countries.

Table 3 describes each variable's distribution by development group. I report the skewness and kurtosis to describe normality of distribution of variables. After transforming GDP per capita, foreign investment dependency and export dependency into their natural logarithm form, distribution of all variables are significantly normally distributed.

Table 4. Correlation Matrix

Variables		1	2	3	4	5	6
GDP Per Capita (One-Year Lagged) [ln]	**1**	1.0000					
Foreign Investment Dependency (FDI / GDP) [ln]	**2**	0.2035	1.0000				
Export Dependency (Total Exports / GDP) [ln]	**3**	0.2818	0.4862	1.0000			
Population Growth (Annual %)	**4**	-0.4329	-0.0022	-0.0750	1.0000		
Urban Population Percentage (%)	**5**	0.5948	0.3609	0.3789	-0.2232	1.0000	
Democracy	**6**	0.3508	0.0942	0.0805	-0.1829	0.3637	1.0000
Labor Participation (Female %)	**7**	-0.1678	-0.0482	-0.1314	0.0649	-0.3076	-0.1399

From the correlation coefficient reported in the Table 4, economic performance is negatively associated with population growth and positively connects with foreign investment, export dependency, urbanization and democracy; democracy level decreases female labor participation percentage, but it is surprisingly positively associated with urban population percentage.

Fixed and Random Effects Regression Result

In current research, unobserved differences among countries, such as religion, culture, and family structure, accounts for some variation of GDP per capita annual change and within-country bias is not strong. Therefore, though generalized least squares random effects model may render estimation less unbiased compared to ordinary least squares fixed effects model, it is still necessary to report random effects estimators to consider important between-country effects. As a guidance to make decision over fixed-effect or random-effect model, the Hausman test's result is strongly insignificant in less-developed countries and significant at 0.05 level in rapidly

developing countries, but strongly significant in high-income countries and all countries. For all these reasons indicated above, I report both fixed-effect and random-effect estimation result for all country groups.

Table 5 reports the results of both fixed-effect and random-effect model estimation across country groups. I report robust standard errors in parenthesis considering the heteroscedasticity problem, and the standardized coefficients in brackets. Estimated coefficients are flagged with stars. After conducting the Hausman test for all country groups, I find the test results are strongly not significant in less-developed countries (p=0.1518) and slightly significant in both rapidly developing countries (p=0.0048) and high-income countries (p=0.0172). However, the Hausman test result is very significant for all countries (p=0.000). Therefore, it is safe to use random-effect estimators to interpret the regression result for less-developed countries and sufficiently reliable for rapidly developing countries and high-income countries when fixed-effect and random-effect results are close. Nevertheless, interpretation of random-effect estimation results for all countries must be conducted with full caution.

Table 5. Fixed Effects and Random Effects Model

	All		Lower		Rapidly Developing		High Income	
	FE	RE	FE	RE	FE	RE	FE	RE
Foreign Investment Dependence	0.113	0.0511	-0.122	-0.160*	0.219	0.233**	0.400**	0.414***
(FDI / GDP) [ln]	(0.0842)	(0.0685)	(0.142)	(0.0927)	(0.140)	(0.104)	(0.192)	(0.150)
	[0.0843]	[0.0380]	[-0.115]	[-0.151]	[0.214]	[0.227]	[0.360]	[0.372]
Export Dependence	0.0884	0.0605	0.369**	0.205*	-0.492*	-0.345**	-0.907	-0.467
(Total Exports / GDP) [ln]	(0.160)	(0.126)	(0.174)	(0.116)	(0.261)	(0.158)	(0.815)	(0.436)
	[0.0364]	[0.0249]	[0.173]	[0.0965]	[-0.297]	[-0.208]	[-0.431]	[-0.222]
Population Growth (Annual %)	-0.279***	-0.303***	-0.288**	-0.314***	0.0322	-0.0150	-0.384***	-0.330***
	(0.0836)	(0.0759)	(0.126)	(0.103)	(0.110)	(0.0953)	(0.126)	(0.106)
	[-0.228]	[-0.248]	[-0.273]	[-0.297]	[0.0360]	[-0.0168]	[-0.369]	[-0.317]
Urban Population Percentage (%)	-0.0290	0.0315***	-0.0339	0.0248***	-8.78e-05	0.00196	0.0186	0.0199
	(0.0215)	(0.00465)	(0.0303)	(0.00776)	(0.0301)	(0.0104)	(0.0822)	(0.0131)
	[-0.405]	[0.440]	[-0.407]	[0.297]	[-0.00127]	[0.0283]	[0.217]	[0.233]
Labor Participation (Female %)	0.0216	9.26e-06	-0.0153	-0.00960*	0.0217	-0.00136	0.0402	0.00526
	(0.0244)	(0.00597)	(0.0343)	(0.00509)	(0.0287)	(0.00673)	(0.0442)	(0.0203)
	[0.214]	[9.16e-05]	[-0.201]	[-0.126]	[0.359]	[-0.0224]	[0.311]	[0.0406]
Democracy	0.00548	0.0154	-0.00506	-0.0180	0.0805**	0.0447**	-0.0138	-0.00931
	(0.0176)	(0.0112)	(0.0254)	(0.0138)	(0.0370)	(0.0193)	(0.0277)	(0.0253)
	[0.0205]	[0.0573]	[-0.0209]	[-0.0743]	[0.507]	[0.282]	[-0.0442]	[-0.0297]
Constant	8.947***	6.465***	9.961***	7.290***	5.496**	7.207***	6.081	8.132***
	(1.633)	(0.501)	(2.169)	(0.619)	(2.285)	(0.839)	(6.068)	(1.481)
Observations	1,418	1,418	621	621	376	376	421	421
Number of Countries	119	119	55	55	29	29	35	35
R^2 within	0.0787	0.0625	0.108	0.0967	0.115	0.104	0.211	0.201
R^2 between	0.195	0.586	0.0161	0.460	0.0522	0.143	0.0194	0.100
R^2 overall	0.0872	0.459	0.00217	0.280	0.0393	0.0916	0.0458	0.100

Note: Robust standard errors are in parenthesis. Standardized coefficients are in brackets. *** p<0.01, ** p<0.05, * p<0.1

The effect of foreign investment dependency on economic growth varies across country groups. For all countries, foreign investment dependency's effect on economic growth is neither significant in fixed-effect model nor random-effect model. Its power to predict economic growth is weak. However, this insignificance is not a surprising result because foreign investment dependency does not have a consistent and unidirectional effect on economic performance across all countries group. For less-developed countries, foreign investment dependency does not show a significant effect on economic growth using within-country fixed-effect estimation. This insignificant fixed-effect model result implies that within-country variation does not significantly contribute to economic growth in less-developed countries. However, the between-country random-effect model estimation result is significantly negative at 0.10 level, which indicates that foreign investment in less-developed countries retards economic growth over time in comparison to other country groups. This negative effect no longer holds true in rapidly developing countries. In rapidly developing countries, within-country fixed-effect estimation result is positive but not significant. Between-country random-effect estimation result is positive and significant at 0.05 level. This result reveals between-country variation contributes more to the change of the dependent variable than within-country effect. Foreign investment, therefore, promotes economic growth in rapidly developing countries over time, compared to other country groups. In high-income groups, the positive direction of foreign investment effect on economic performance holds in both within-country fixed-effect estimation and between-country random-effect estimation. Hence, from results presented in Table 5, foreign investment dependency is economically harmful to less-developed countries, but beneficial to economic growth in rapidly developing countries and high income countries. This inconsistent pattern corroborates the insignificant coefficient estimators in pooled-country model.

Some other patterns captured by control variables also have profound implication in current research. Export dependency has significantly positive effects for economic performance of less-developed countries across both within-country fixed-effect and between-country random effect estimation. However, this direction reverses in rapidly developing countries, where export dependency negatively affects economic growth. This result shows less-developed countries have been undertaking export-oriented growth and export is positively associated with these countries' economic performance. However, rapidly developing countries tend to reduce their economies' dependence on foreign power and support industries with long-term promising effects on economic growth. However, the positive effect of export dependency does not suggest countries in the less-developed group should unconditionally increase export as percentage of GDP, despite its positive contribution to economic growth. Some empirical research finds export dependency introduces many environmental burdens for social development in less-developed countries (Austin 2010; Jorgenson 2006). Furthermore, the significantly negative impact of trade dependency on economic performance prompts a question for further research under this topic. In high-income countries, export dependency has no impact on economic performance using both within-country fixed effect and between-country random-effect estimation.

For all countries, population retards economic growth, particularly in less-developed and high-income countries, where population's impact is negative and significant across both fixed-effect and random-effect estimation. Urbanization also shows divergent effect across country groups. In less-developed countries, urban population percentage positively contributes to economic performance, but this significant result cannot be found in other country groups. It is likely that urbanization implies a positive change of lifestyle and economic growth in some

countries, but retards economic growth and produces urban slums in some other countries. However, this explanation is not empirically profound and needs attention of future research.

Result of female labor participation demonstrates some surprising results in less-developed countries. It is likely that females in rapidly developing countries participate in the workforce under the force of "no alternatives". They tend to be paid with low wages and work in the industries with promising contribution to economic growth.

Another inspiring pattern found in current research is the significant positive effects of democracy in rapidly developing countries. This result is significant using both within-country and between-country estimation. It corroborates Evans' theory of "embedded autonomy" and this result shows that rapidly developing countries' economic performance is quite sensitive to government's extensive connection to the society in comparison to other country groups. However, this effect from political setting may be combined with investment dependency to wield influence over economic growth. Thus, this effect of combination requires further research using a more advanced quantitative method, such as structural equation modeling, to thoroughly examine the impact under interaction.

DISCUSSION

The current study addresses the polarized debate regarding the influence of foreign investment or foreign capital penetration on economic development. I find support for dependency arguments that foreign capital penetration is pernicious to economic development in poor nations as I find that foreign investment in lower-income countries is negatively associated with GDP per capita across nations over time. However, I find that foreign investment is positively associated with economic development in rapidly developing, semi-periphery with

lower income countries, and core nations. This divergent effect presents new substantive evidence and informs theory on global development dynamics.

The current research finds that foreign investment dependency has positive effects on economic growth in rapidly developing countries, but negatively impacts on economic performance in less-developed countries. In high-income countries, foreign investment also demonstrates a positive effect on economic performance, but this result may be associated with the fact that foreign investment going to high-income countries also comes from other high-income countries and this reciprocal feature makes significant contributions to the positive effect of foreign investment dependency on economic growth. Therefore, for future research, it is important to trace the source and decompose the target industries of foreign investment.

Countries with a lower income level may not have a well-developed economic structure to prevent foreign investment from exploiting resources and profits at the cost of environmental degradation, labor devaluation, or depreciation of products or resources. In contrast, countries at a higher level of economic development may be able to convert foreign investment into GDP growth. These countries tend to have more robust economic structures and stronger domestic market based on rising affluence. Moreover, rapidly developing countries used to be less-developed economics. However, these countries do not continue the tragedy of "development of underdevelopment" and attempt to restructure their economy to siphon the benefit of foreign investment for their own economy. Although the mechanism of such transformation is still unclear in current research, it is not persuasive to apply the polarized dependency theory to all countries and make the dichotomous argument that foreign investment is good or bad.

Reproduced global inequality in the process of development attracts incessant academic attention. From Bornschier and Chase-Dunn (1985) to Firebaugh (1992), Dixon and Boswell

(1996), a huge debate in academia concerning the outcomes of international dependence on investment reveals its particular importance to stress some recent development tragedies in poor nations, such as low wage, social welfare, environmental degradation, health problems and corruption. Despite the pattern of interdependency and more polarized global society, some economies (such as South Korea and Hong Kong) formerly subjugated to global core power, undertook enormous economic, social and political development in past decades and rose up to the echelon of high-income countries. Some of these economies were dedicated to export business and received a large amount of foreign investment. However, these countries were not trapped in such a dependent situation but demonstrated the power and possibility to better use foreign money to support domestic economic growth. Governments of these economies exceled in directing foreign investment to projects with long-term positive effects on economic growth. This argument is supported by the finding in current research that the degree of democracy positively affects economic performance in rapidly developing countries. However, this significant positive impact is not found in other country groups. This result also provides solid support of Evans' theory of the connection among development, embeddedness and autonomy and this connection can be particularly strong in rapidly developing countries.

However, the current study does not address how these rapidly developing countries rose up from less-developed countries. Besides prudent policy and guidance to direct foreign investment, international flow of capital, workforce, knowledge and technology can also be used to explain the transcendence of these rapidly developing countries. Furthermore, the current research, which is limited to narrow focus of quantitative method, cannot persuasively answer whether the mode of development of these rapidly developing countries can be imitated to tackle

some ongoing global challenges. More theoretical and qualitative efforts are needed to answer these questions.

Another problem shown in the result output is the low R-square within and between value in rapidly developing countries and high-income countries. This low value can be explained by the relative narrow time points included in the dataset, which makes panel analysis less powerful to capture within-country and between-country effects.

Modern global society is experiencing one of the most tremendous changes in history. Increasingly globalized economic and political connections among countries motivate each country's government to mount a sustainable and solid response to this change. It is indeed not a good solution to eschew global involvement of trade and dependency, but government should pay more heed to direct the flow of foreign capital inside recipient economy. Free-market theory may be against power's involvement in economic activities and pass this responsibility to the independent operation of market force. Nevertheless, market failure can sometimes pose more harm to recipient economies. Besides a careful and meticulous policy design to guide foreign investment, government should develop a flexible but efficient bureaucratic setting to build a tight connection between power and powerlessness in order to maintain the "embeddedness" of "autonomy". Government should also inhibit the growth of population, which can cause a big burden to economic and social advancement.

The current research also provides the advice to current world-systems research that it is arbitrary to lump periphery and semi-periphery countries into one category and make comparison between the lumped "poor" and "rich" countries. This attempt overlooks the fundamental value of world-systems theory which adds "semi-periphery" between the core and the periphery. This additional layer offers theoretical insight into the world-systems under unprecedented transitions

in the late 20th century. Furthermore, following the prosperity of emerging market in the late 20th century, the “lumped poor” category incurs more troubles when it mixes countries with good performance in development relying on foreign investment and export-oriented industrialization, such as China and Brazil. For future research, it is indispensable to parcel out countries in the “middle”. Methodologically, circumstances in these countries cannot be fully represented by an intercept-shift dummy variable appended in a regression model. This research recommends future research to follow my lead to apply more rigorous, concrete and solid analysis on the ongoing social changes in current world-systems.

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Appendix A. Countries by Income Levels

Group A. Less-Developed Countries

Afghanistan	Ethiopia	Malawi	Senegal
Armenia	Gambia, The	Mali	Sierra Leone
Bangladesh	Georgia	Mauritania	Solomon Islands
Benin	Ghana	Micronesia	Somalia
Bhutan	Guatemala	Moldova	South Sudan
Bolivia	Guinea	Mongolia	Sri Lanka
Burkina Faso	Guinea-Bisau	Morocco	Sudan
Burundi	Guyana	Mozambique	Swaziland
Cabo Verde	Haiti	Myanmar	Syrian Arab Republic
Cambodia	Honduras	Nepal	Tajikistan
Cameroon	India	Nicaragua	Tanzania
Central African Republic	Indonesia	Niger	Timor-Leste
Chad	Kenya	Nigeria	Togo
Comoros	Kiribati	Pakistan	Uganda
Congo, Dem. Rep	Korea, Dem Rep.	Papua New Guinea	Ukraine
Congo, Rep.	Kosovo	Paraguay	Uzbekistan
Côte d'Ivoire	Kyrgyz Republic	Philippines	Vanuatu
Djibouti	Lao PDR	Rwanda	Vietnam
Egypt, Arab Rep.	Lesotho	Samoa	West Bank and Gaza
El Salvador	Liberia	São Tomé and Principe	Yemen, Rep.
Eritrea	Madagascar		Zambia
			Zimbabwe

Group B. Rapidly Developing Countries

Albania	Colombia	Lebanon	Serbia
Algeria	Costa Rica	Libya	Seychelles
American Samoa	Cuba	Macedonia, FYR	South Africa
Angola	Dominica	Malaysia	St. Lucia
Argentina	Dominican Republic	Maldives	St. Vincent and the
Azerbaijan	Ecuador	Marshall Islands	Grenadines
Belarus	Fiji	Mauritius	Suriname
Belize	Gabon	Mexico	Thailand
Bosnia and Herzegovina	Grenada	Montenegro	Tonga
Botswana	Hungary	Namibia	Tunisia
Brazil	Iran, Islamic Rep.	Palau	Turkey
Bulgaria	Iraq	Panama	Turkmenistan
China	Jamaica	Peru	Tuvalu
	Jordan	Romania	Venezuela, RB
	Kazakhstan		

Group C. High-Income Countries

Andorra	Czech Republic	Korea, Rep.	Qatar
Antigua and Barbuda	Denmark	Kuwait	Russian Federation
Aruba	Equatorial Guinea	Latvia	San Marino
Australia	Estonia	Liechtenstein	Saudi Arabia
Austria	Faeroe Islands	Lithuania	Singapore
Bahamas, The	Finland	Luxembourg	Sint Maarten
Bahrain	France	Macao SAR, China	Slovak Republic
Barbados	French Polynesia	Malta	Slovenia

Belgium	Germany	Monaco	Spain
Bermuda	Greece	Netherlands	St. Kitts and Nevis
Brunei Darussalam	Greenland	New Caledonia	St. Martin
Canada	Guam	New Zealand	Sweden
Cayman Islands	Hong Kong SAR, China	Northern Mariana Islands	Switzerland
Channel Islands	Iceland	Norway	Trinidad and Tobago
Chile	Ireland	Oman	Turks and Caicos Islands
Croatia	Isle of Man	Poland	United Arab Emirates
Curaçao	Israel	Portugal	United Kingdom
Cyprus	Italy	Puerto Rico	United States
	Japan		Uruguay
			Virgin Islands (U.S.)

Vita

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